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ABSTRACT

This compilation includes virtually all the standardized science tests published since 1959 and available to the secondary and elementary school science teacher. The standardized tests have been arranged into seven sections: Elementary Science Tests, Biology Tests, Chemistry Tests, Earth Science Tests, General Science Tests, Physics Tests, and Other Science Tests. Each review is structured in outline form under the follcwing headings: Title, Author, Publisher, Date of publication, Number and description of forms, Time for testing, Scoring, Reliability, Validity, Subscales, Target audience, Recommended use, Administration, Area measured, and Classroom use. Other information on each test is included in a narrative description. Appendices include the names and addresses of the publishers of standardized science tests, a glossary of terms used in the mcnograph, an abstracted bibliography on standardized testing, and a description of standardized tests in progress. (Author/JR)

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STANDARDIZED SCIENCE TESTS

a descriptive listing

SE 016 156

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STANDARDIZED SCIENCE TESTS: A DESCRIPTIVE LISTING

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PREFACE

When occasions arise in which teachers wish to gauge the accomplishments of a class or individual science students against some generally accepted criterion, they turn to standardized tests. Such tests, because they have been administered to large numbers of students in various situations and at various times, help the teacher to recognize the general achievement level of his students in relation to levels achieved by other students in specified areas of content. Such tests may have the further usefulness of serving as controls for the teacher's own tests or as baselines for experimentation with various teaching methods or program content.

Teachers should observe the same cautions and sensitivity in using standardized tests that they use in other forms of evaluation. The primary functions of tests are for guidance, for improvement of instruction, and to some extent as a teaching tool. They should not be used to categorize students, nor can they take the place of evaluation designed especially for the objectives of the individual teacher and his program. By their very nature most current standardized tests are stronger in content areas than in the areas of processes and attitudes. Teachers should keep this fact in mind as they select and use standardized tests. They should also be aware of what is often a time lag between the content and approach of standardized tests and emerging and current educational philosophy.

Virtually all the standardized science tests published since 1959 and available to the secondary and elementary science teacher are included in this compilation. These tests have been reviewed and abstracted so that a classroom science teacher can locate the standardized test most appropriate for his particular need. Many of these tests deal with science achievement on a low cognitive level. A few tests, however, deal at least in part, with science processes and higher level cognitive sophistication. No standardized science tests relating to the affective domain have been located and consequently have not been included in this monograph. The authors will appreciate notification of any standardized tests in the cognitive or affective domains that have been omitted.

It is not the intent of this monograph to suggest all the purposes for which the test may be used. Although suggestions for use have been made by the test publishers and the authors of this monograph, it ultimately remains the responsibility of the classroom teacher or the school testing program personnel to evaluate a specific test with respect to its appropriateness for the classroom or school testing situation. If a science teacher locates a test in this monograph that seems suitable for his class, it is suggested that he obtain a specimen set from the publisher to be certain that the objectives of the test meet the objectives of the class instruction and the instructional approach. This is a crucial factor since not all standardized tests constructed since 1959 recognize the impact of the currently used programs. More detailed critical reviews of a few of these tests may be found in *The Seventh Mental Measurements Yearbook* edited by Buros.

The standardized tests have been arranged into seven sections: Elementary Science Tests, Biology Tests, Chemistry Tests, Earth Science Tests, General Science Tests, Physics Tests, and Other Science Tests. This classification should facilitate the prompt location of tests for any subject area. Each review contains the title, author, publisher, date of publication, target audience, number and description of forms, time of testing, scoring, reliability, validity, subscales, recommended use, administration, area in which the test purports to measure, and teachers' classroom use, all in outline form. This should expedite the detection of these important characteristics. Other information on each test is included in a narrative description for that particular test.

Other useful features of this monograph are the appendices. This section includes the names and addresses of the publishers of standardized science tests, a glossary of terms used in the monograph, an abstracted bibliography on standardized testing, and a description of standardized tests in progress.

"Analyses of Science Tests," prepared by the NSTA Committee on Evaluation and published in 1959, provided valuable information on those tests available at that time. The National Science Teachers Association is not pushing or endorsing the use of standardized tests, but is merely making available a compendium of what is available in this category of educational materials. It is hoped that this publication will also provide classroom science teachers, educational researchers, and those responsible for school testing programs, easy access to concise information on science tests available for high school and elementary students.

J.W. and L.S.

ELEMENTARY SCIENCE TESTS
(includes K-8 or Middle School)

TITLE: Borman-Sanders Elementary Science Test

AUTHOR: Ina M. Borman and M.W. Sanders

PUBLISHER: Bureau of Educational Measurements, Kansas State Teachers College

DATE OF PUBLICATION: 1964

NUMBER AND DESCRIPTION OF FORMS: Forms IA, IB, IIA, IIB

TIME FOR TESTING: 40 minutes for each test

SCORING: Hand

RELIABILITY: Ranges from .88 to .91 on the four tests

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 5-8

RECOMMENDED USE: Determining student achievement, checking efficiency of instruction, assigning school marks, diagnosing student and class-weaknesses, assessing motivation of student effort

ADMINISTRATION: Brief directions given in test booklet

AREA MEASURED: Science achievement

CLASSROOM USE: To evaluate student knowledge of science terms and practical applications of science principles

---

This test, geared for students in grades 5 through 8, is composed of seventy-five, 4-alternative multiple-choice questions and six, 4-item groups of matching questions. Most of the test items measure in the content areas of biology and earth science, with about one-third of the items in physics and chemistry.

Norm tables have been developed for each test for grades 5, 6, 7, and 8. The student's raw score is interpreted by percentile rank. The test manual suggests that percentile rank scores can be used for assigning class grades and gives specific directions for assigning numerical or letter grades.

The test sells for $1.75 per package of 25 (directions and key included). In quantities less than 25, the tests sell for 10¢; directions, 15¢; key, 10¢. A specimen set can be obtained for 50¢ postpaid.

TITLE: The Butler Life Science Concept Test

AUTHOR: D.F. Butler

PUBLISHER: Psychometric Affiliates

DATE OF PUBLICATION: 1969

NUMBER AND DESCRIPTION OF FORMS: 1 form

TIME FOR TESTING: 20-40 minutes

SCORING: Hand

RELIABILITY: Ranges from .70 to .88 for internal consistency and .84 to .94 for stability

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 1-6

RECOMMENDED USE: Diagnostic purposes and achievement

ADMINISTRATION: For group or individual administration

AREA MEASURED: Concepts on living things

CLASSROOM USE: To evaluate student recognition of animals, plants, and biological processes

---

This test is composed of 37 plates of 6 pictures testing the concepts of living things on (1) structure, (2) metabolism, (3) growth, (4) reproduction, (5) responsiveness, and (6) adaptation. The students are asked a question orally that applies to a group of six pictures, and they check "yes" if the picture applies to the question and "no" if it does not. Thirty-five questions compose the actual test, and two questions are practice items.

Raw scores are interpreted through the use of grade equivalent scores or standard scores. Item analysis data were computed resulting in a mean discrimination index of .50 and a mean difficulty index of .67.

Test booklets are available for $7.50 per package of 25. A specimen set may be obtained for $2.

TITLE: **Educational Development Series - Advanced Level - Science**

AUTHOR: Scholastic Testing Service, Inc.

PUBLISHER: Scholastic Testing Service, Inc.

DATE OF PUBLICATION: 1963

NUMBER AND DESCRIPTION OF FORMS: Forms A, B

TIME FOR TESTING: 35 minutes

SCORING: Machine scoring by STS

RELIABILITY: Ranges from .85 to .89 across grades

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 6-9

RECOMMENDED USE: To compare achievement; to relate achievement to motivation

ADMINISTRATION: Specific directions given

AREA MEASURED: Science achievement

CLASSROOM USE: To evaluate student knowledge of facts and comprehension of science principles

---

The science section of this test is part of a battery of tests geared for upper elementary students. Each of the 75 items on this test are keyed by content area. The majority of the questions are categorized in the area of Critical Thinking, decreasing in number in Physical Science, Biological Science, Earth and Astronomy, and Health and Safety.

The technical report which may be purchased from STS contains information on national norms, mean scores, grade scores, percentile ranks, score stability, validity development, and reliability. The comprehensive information in the technical report can be of value in test score interpretation.

The entire battery of tests including the science test may be purchased for $22 for a package of 20 tests and a test manual.

TITLE: **Educational Development Series - Elementary Level - Science**

AUTHOR: Scholastic Testing Service, Inc.

PUBLISHER: Scholastic Testing Service, Inc.

DATE OF PUBLICATION: 1963

NUMBER AND DESCRIPTION OF FORMS: Form A

TIME FOR TESTING: 35 minutes

SCORING: Machine scoring by STS

RELIABILITY: .83

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 4-6

RECOMMENDED USE: For career planning; to compare achievement

ADMINISTRATION: Specific directions given in test manual

AREA MEASURED: Science achievement

CLASSROOM USE: To evaluate student knowledge of facts and comprehension of science principles

---

This science test is part of a battery of tests specifically geared for students in grades 4-6. There are sixty, 5-alternative multiple-choice questions on this test that claim to measure science concept achievement, critical thinking ability, and the ability to draw conclusions. Each item is keyed to the content areas of Health and Safety, Simple Machines, Physical Science, Biological Science, Earth and Astronomy, and Critical Thinking. Content emphasis is in the physical and biological sciences.

A technical report containing important statistical information, test score interpretation, and norms may be purchased from the company. This booklet is a valuable aid to the teacher or guidance counselor for the purpose of educational decision making.

The entire battery of tests including the science test may be purchased for $20 for a package of 20 tests and a test manual.

TITLE: **Metropolitan Achievement Tests - Intermediate - Science**

AUTHOR: Walter N. Durost and others

PUBLISHER: Harcourt Brace Jovanovich, Inc.

DATE OF PUBLICATION: 1970

NUMBER AND DESCRIPTION OF FORMS: Forms F, G, H

TIME FOR TESTING: 35 minutes

SCORING: Hand or machine

RELIABILITY: .95

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 5-6

RECOMMENDED USE: Class organization; selection of instructional materials, determination of student strengths and weaknesses

ADMINISTRATION: Specific directions given in administration booklet

AREA MEASURED: Achievement in science

CLASSROOM USE: To evaluate factual knowledge and comprehension, and application of science principles

---

The 78 items on this test are part of a battery of tests which include tests in social studies, word knowledge, reading, language, spelling, mathematics and science. The test appears to be divided into two sections. Word use, understanding, and relationships compose the first section of the test. Factual and conceptual knowledge seem to be stressed in the second portion of the test. Questions are generated from the content areas of the biological, physical, and earth sciences.

Test scores may be interpreted in several ways. Raw scores may be converted to standard scores, percentile rank or grade equivalents. The accompanying test manuals list the tables necessary for the desired test score interpretation. Other statistical data are also included for use by the teacher.

Tests may be purchased for $5.20 per package of 35 and an Examiner's Kit may be obtained for $1.25.

TITLE: Minnesota High School Achievement Examination - Science Grade 7

AUTHOR: V.L. Lohmann, Editor

PUBLISHER: American Guidance Service, Inc.

DATE OF PUBLICATION: 1972 - one form of this test is revised each year

NUMBER AND DESCRIPTION OF FORMS: Forms EH, FI, GJ

TIME FOR TESTING: 60 minutes

SCORING: Hand or machine

RELIABILITY: Not discussed

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grade 7

RECOMMENDED USE: To improve instruction; to facilitate curriculum and group analysis; to assess pupil progress; to assist in educational and vocational guidance

ADMINISTRATION: Specific directions given in manual

AREA MEASURED: Achievement in life science

CLASSROOM USE: To evaluate knowledge of facts in life science

---

The one-hundred-fifteen, 5-alternative items on this test are subdivided into four units. Unit I deals with the topics of General Biology. Unit II treats the topics of Plants and Animals. Unit III measures in the area of Health, while Unit IV is composed of three items in Conservation. The test manual claims that the test includes items that measure recall of facts, evaluation of concepts, and the ability to infer and to draw conclusions. The content subdivisions apply only to form FI – others differ slightly.

Raw scores can be interpreted by percentile rank which were calculated from data on nearly 3,000 students. Item difficulty data are also listed in table form.

Tests sell for 10¢ per copy and a test manual may be obtained for $1. A specimen set may be purchased for $1.10.

TITLE: **Minnesota High School Achievement Examination - Science Grade 8**

AUTHOR: V.L. Lohmann, Editor

PUBLISHER: American Guidance Service, Inc.

DATE OF PUBLICATION: 1969 - one form of this test is revised each year

NUMBER AND DESCRIPTION OF FORMS: Forms EH, FI, GJ

TIME FOR TESTING: 60 minutes

SCORING: Hand or machine

RELIABILITY: Not discussed

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grade 8

RECOMMENDED USE: To assist in educational and vocational guidance; to improve instruction; to further curriculum analysis; to assess pupil progress

ADMINISTRATION: Specific directions given in test manual

AREA MEASURED: Achievement in earth science

CLASSROOM USE: To evaluate knowledge of facts in earth science

---

This testing instrument contains one-hundred-one, 5-alternative items that are subdivided into nine subgroups or units. The units are as follows: Unit I - Astronomy and Space Science; Unit II - Rocks and Minerals of the Earth; Unit III - Landforms; Unit IV - Molding the Earth's Crust; Unit V - Sculpturing the Earth's Surface; Unit VI - The Waters of the Earth; Unit VII - The Earth's History; Unit VIII - Meteorology and Climatology; and Unit IX - Conservation. The manual claims that these questions measure not only recall of facts, but also the evaluation of concepts and the ability to infer and draw conclusions.

Normative data are available in table form. Item difficulty information may also be located in the manual. The content subdivisions of this test apply to form FI. Other forms differ slightly in content.

Tests may be purchased for 10¢ per copy, and a test manual may be obtained for $1. A specimen set may be purchased for $1.10.

TITLE: **Sequential Tests of Educational Progress - Series II - Form 4**

AUTHOR: Cooperative Tests and Services

PUBLISHER: Educational Testing Service

DATE OF PUBLICATION: 1969

NUMBER AND DESCRIPTION OF FORMS: Form 4A, 4B

TIME FOR TESTING: 40 minutes

SCORING: Hand or machine

RELIABILITY: Ranges from .81 to .89

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 4-6

RECOMMENDED USE: To assess student progress

ADMINISTRATION: Specific directions given in test manual

AREA MEASURED: Understanding of science

CLASSROOM USE: To evaluate student knowledge of science facts, comprehension of scientific principles, and interpretation of data

---

The test manual has a printed table of specifications for each form of the test. Each question is keyed by content area and mental skill. It appears that most of the items on this test measure in the area of the biological sciences with some emphasis in chemistry, physics, and earth science. Many of the questions measure in the knowledge and comprehension levels with a great deal of emphasis on the application level. A few questions measure higher abilities.

Very complete statistical data are listed in table form in the manual. These include norms, means, standard deviations, items analysis information, and reliabilities. The test manual describes the use of these statistics for interpreting student scores.

Test booklets are available for $7 per package of 20 tests. A specimen set may be obtained for $5.

TITLE: Sequential Tests of Educational Progress – Series II – Form 3

AUTHOR: Cooperative Tests and Services

PUBLISHER: Educational Testing Service

DATE OF PUBLICATION: 1969

NUMBER AND DESCRIPTION OF FORMS: Forms 3A, 3B

TIME FOR TESTING: 40 minutes

SCORING: Hand or machine

RELIABILITY: Ranges from .82 to .89

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 7-9

RECOMMENDED USE: To assess student progress

ADMINISTRATION: Specific directions given in test manual

AREA MEASURED: Understanding of science

CLASSROOM USE: To evaluate student knowledge of science facts, comprehension of scientific principles, and interpretation of data

---

The 50 items on this test are classified in the test manual by content area and mental skill. The majority of the questions emphasize the fields of the biological and physical sciences. Other questions cover the areas of chemistry and earth science. Many items measure in the knowledge and comprehension levels but a good portion of the emphasis has been placed on the application level and higher abilities.

The test manual carries very complete statistical data for test score interpretation. Among the important data that can be found listed and described in the manual are test means, normative data, standard deviations, reliabilities, equating of forms, percentile ranks, converted scores and item difficulty information. The manual aids the teacher in interpreting student scores.

Test booklets sell for $7 per package of 20 tests. A specimen set is available for $5.

TITLE: **SRA Assessment Survey - Achievement Series - Science**

AUTHOR: Robert A. Naslund and others

PUBLISHER: Science Research Associates, Inc.

DATE OF PUBLICATION: 1971

NUMBER AND DESCRIPTION OF FORMS: Forms E, F

TIME FOR TESTING: 30 minutes for each science test

SCORING: Hand or machine

RELIABILITY: Blue level - .88, Green level - .92, Red level - .89

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 4-9

RECOMMENDED USE: To gain an overview of student performance

ADMINISTRATION: Specific directions given in test manual

AREA MEASURED: Academic achievement in science

CLASSROOM USE: To evaluate knowledge of scientific facts and understanding of scientific principles

---

There are three levels of test booklets constructed for assessing student achievement in grades 4-9. Each booklet contains a battery of tests including a section on science. The blue level is the easiest, and the red level is the most difficult. The green level contains questions which overlap the most difficult questions from the blue version and the easiest questions from the red level. This has been done so that student scores can be interpreted by growth and progress over grade levels.

Each form of the test booklets contains questions in the content areas of living things, matter and energy, earth and space, experimentation, charts and tables, and reading comprehension.

Norms have been calculated on a stratified sample of students in grades 3-9. A fairly complete discussion on test score interpretation and use of these scores by the teacher, superintendent, principal, researcher, and guidance counselor can be found in the test handbook.

Tests sell for $15 per package of 25 heavy-duty, reusable booklets.

TITLE: **Stanford Achievement Test - Intermediate II - Science**

AUTHOR: Truman L. Kelley and others

PUBLISHER: Harcourt Brace Jovanovich, Inc.

DATE OF PUBLICATION: 1964

NUMBER AND DESCRIPTION OF FORMS: Forms W, X, Y, Z

TIME FOR TESTING: 25 minutes

SCORING: Hand or machine

RELIABILITY: .89

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 5-6

RECOMMENDED USE: Determining group and individual differences in science achievement

ADMINISTRATION: Specific directions given in test manual

AREA MEASURED: Achievement and skills in science

CLASSROOM USE: To evaluate factual knowledge and comprehension, and application of science principles

---

This instrument is composed of fifty-eight, 4-alternative questions measuring the achievement of pupils in important skill and content areas. The results on this test may be used by the teacher as the basis for planning an individualized instruction program, to determine rate of progress of students, to gather data on ability range in a classroom, to provide information for grouping students, and to evaluate pupil achievement with respect to age and mental ability.

The content areas of the questions cover all areas of general science. Particular stress seems to be given to the biological and physical sciences.

Raw scores on this test are converted to grade scores and then can be interpreted by percentile ranks and stanines. Norm tables are listed for end of 4th grade, beginning, middle, and end of year for 5th and 6th grade.

Test booklets sell for $5.20 per package of 35; a specimen set may be obtained for $1.75.

SECONDARY BIOLOGY TESTS

TITLE: **BSCS Comprehensive Final Examination**

AUTHOR: Biological Sciences Curriculum Study

PUBLISHER: The Psychological Corporation

DATE OF PUBLICATION: 1966

NUMBER AND DESCRIPTION OF FORMS: Forms J, K

TIME FOR TESTING: 45 minutes

SCORING: Hand or machine

RELIABILITY: Median reliability Form J - .82, Form K - .84

VALIDITY: Content validity

SUBSCALES: None

TARGET AUDIENCE: Grade 10 BSCS students

RECOMMENDED USE: Assessing individual progress in first-year biology; evaluating instruction; assessing student achievement

ADMINISTRATION: Direction given in test manual

AREA MEASURED: Achievement in BSCS Biology

CLASSROOM USE: To evaluate student ability to comprehend and apply knowledge of biology principles and processes

---

This examination is appropriate for the evaluation of students after a year of instruction using any of the three versions of the Biological Sciences Curriculum Study textbooks. The test manual suggests that it can be used as a testing instrument for other modern biology courses.

Normative data were gathered on more than 22,000 students using the BSCS program in various parts of the country. Raw scores can be interpreted by the use of norm tables which give the percentile rank for score bands.

Correlation data between the BSCS Comprehensive Final Examination and the BSCS Quarterly Achievement Tests are presented in table form in the test manual.

Test booklets and answer sheets sell for $5.80 per package of 32. Specimen sets are available for 75¢ each.

TITLE: **Cooperative Science Test - Biology**

AUTHOR: Cooperative Test Division of ETS

PUBLISHER: Educational Testing Service

DATE OF PUBLICATION: 1963

NUMBER AND DESCRIPTION OF FORMS: Forms A, B

TIME FOR TESTING: 40 minutes for each of two parts

SCORING: Hand or machine

RELIABILITY: Total test, Form A - .92; Total test, Form B - .92

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 10-12

RECOMMENDED USE: Assessing achievement, grouping students, gathering diagnostic information

ADMINISTRATION: Specific instructions given in manual

AREA MEASURED: Biology achievement

CLASSROOM USE: To evaluate factual recall and comprehension of biological terms and principles

---

This biology test is composed of two parts with a total of 120 questions geared for high school students. Part I deals with General and Human Biology while Part II treats the Diversity of Life. Each part contains questions on the cognitive levels of knowledge, comprehension, application, analysis, and evaluation.

Items are classified according to content area and cognitive skill. Tables found in the manual key each question on both forms.

Table information also gives normative information for urban, suburban, and national groups. Raw scores can be interpreted with respect to these norms by utilizing converted scores and percentile ranks. Other statistics such as mean scores, standard deviation, discrimination, and difficulty indices for each question can be found in the test manual. All test data were gathered on students in grades 10-12.

Test booklets sell for $6 per package of 20. A specimen set can be obtained for $3.

TITLE: Emporia Biology Test

AUTHOR: Ted F. Andrews and M.W. Sanders

PUBLISHER: Bureau of Educational Measurements, Kansas State Teachers College

DATE OF PUBLICATION: 1964

NUMBER AND DESCRIPTION OF FORMS: Forms A, B (2 tests each)

TIME FOR TESTING: 40 minutes for each test

SCORING: Hand scoring

RELIABILITY:

Form A Test I	– .89	Form B Test I	– .84
Test II	– .82	Test II	– .87

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: High school biology students

RECOMMENDED USE: Determine achievement of class or individuals compared to national norms

ADMINISTRATION: Brief directions given

AREA MEASURED: Biology achievement

CLASSROOM USE: To evaluate factual knowledge in biology

There are four tests available for use in this series of biology tests. Each of the two forms have two tests which cover factual information found in any traditional biology course taught at the high school level. It appears that a great deal of vocabulary knowledge is essential for success on the test. Very few high-level cognitive skills are required for the test.

The number of questions vary on each test and range from 85 to 115. The majority of the questions on each test are 4-alternative multiple-choice items. Two of the tests have matching sections.

Normative data are sparse. Raw scores can be converted to percentile ranks for purposes of interpretation. The test manual suggests that class scores or individual student scores can be interpreted by percentile rank.

The test sells for $1.75 per package of 25 (directions and key included). In quantities of less than 25, the tests sell for 10¢; directions, 15¢; key, 10¢. A specimen set can be obtained for 50¢ postpaid.

TITLE: General Biology Test

AUTHOR: Lester D. Crow and James G. Murray

PUBLISHER: Psychometric Affiliates

DATE OF PUBLICATION: 1961

NUMBER AND DESCRIPTION OF FORMS: Form A

TIME FOR TESTING: 35 minutes

SCORING: Hand

RELIABILITY: .95

VALIDITY: Content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 9-12

RECOMMENDED USE: Not discussed

ADMINISTRATION: Brief directions given

AREA MEASURED: Biology achievement

CLASSROOM USE: To evaluate student knowledge of biology facts and principles

---

There are one-hundred-twenty, 4-alternative multiple-choice questions on this biology test. The first 50 items, Part I of the test, deal with uses, processes, and results in biology. Part II contains 10 items quizzing the student on important biological scientists and their activities. Part III treats miscellaneous facts in biology through the remaining 60 questions.

Normative data were gathered on 2,751 biology students from various parts of the country. Ranges of raw scores can be interpreted by ranges in percentile ranks.

Test booklets may be purchased for $5 per package of 25 tests. A specimen set may be obtained for $1.50.

TITLE: Minnesota High School Achievement Examination -- Biology

AUTHOR: V.L. Lohmann, Editor

PUBLISHER: American Guidance Service, Inc.

DATE OF PUBLICATION: 1969 - one form of this test is revised each year

NUMBER AND DESCRIPTION OF FORMS: Forms EH, FI, GJ

TIME FOR TESTING: 60 minutes

SCORING: Hand or machine

RELIABILITY: Not discussed

VALIDITY: Claims content validity

SUBSCALES: 8 content subscales may be used

TARGET AUDIENCE: Hign school biology students

RECOMMENDED USE: Improvement of instruction; curriculum analysis; group diagnosis; pupil progress; guidance

ADMINISTRATION: Directions given in test manual

AREA MEASURED: Biology achievement

CLASSROOM USE: To determine student factual knowledge in biology

---

This is one of 26 tests used to evaluate student achievement in various content areas in Minnesota schools. The manual claims that the use of this test need not be limited to Minnesota students.

The test is divided into 8 units. Each of these units may be used as a subscale to evaluate instructional effectiveness or student weaknesses. The units are (1) The Scientific Study of Life, (2) The World of Plant Life, (3) The Invertebrates, (4) The Higher Forms of Animals, (5) Human Physiology, (6) Health, (7) Living Things Change, and (8) Ecology and Conservation. There are one-hundred-six, 5-alternative multiple-choice items on the test. The raw score can be interpreted by percentile rank. The content subdivisions apply only to form FI. Other forms will differ slightly.

Normative data and item analysis data can be found in table form in the test manual.

Test copies sell for 10¢ per copy and a test manual may be obtained for $1. Specimen sets of this test can be purchased for $1.10.

TITLE: Nelson Biology Test

AUTHOR: Clarence H. Nelson

PUBLISHER: Harcourt Brace Jovanovich, Inc.

DATE OF PUBLICATION: 1965

NUMBER AND DESCRIPTION OF FORMS: Forms E and F

TIME FOR TESTING: 40 minutes

SCORING: Hand or machine

RELIABILITY: .92 for both forms

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: High school biology students

RECOMMENDED USE: Grouping or classification of students, evaluation of instructional methods and scholastic growth, appraisal of biology program

ADMINISTRATION: Specific directions given in manual

AREA MEASURED: Attainment of objectives in a typical high school biology course

CLASSROOM USE: To evaluate factual knowledge, understanding of the scientific method, and application of biological processes

---

This test is a revision of the 1950 edition which has attempted to combine the measurement of objectives of a traditional biology class plus the conceptual schemes of the three versions of the Biological Sciences Curriculum Study. The test manual claims it is appropriate for both approaches to teaching high school biology.

Both forms of the instrument are designed to evaluate the skills of knowledge, understanding and application in the content areas of living things, life processes, ecological relationships, methodology and research. Each item is classified according to both of these factors.

Item analysis data are given for each question with the mean difficulty for both forms of .47 and median discrimination index of .497 for form E and .471 for form F.

There are 65, four-distractor questions with an additional distractor of "Don't Know" to reduce guessing.

Raw test scores may be converted into standard scores and interpreted through the use of percentile ranks and stanines. The test manual aids the teacher in using and describing the conversion tables. Tests sell for $9 per package of 35. A specimen set may be obtained for $1.50.

TITLE: Processes of Science Test

AUTHOR: Biological Sciences Curriculum Study

PUBLISHER: The Psychological Corporation

DATE OF PUBLICATION: 1965

NUMBER AND DESCRIPTION OF FORMS: Form A

TIME FOR TESTING: 35 minutes

SCORING: Hand or machine

RELIABILITY: .82

VALIDITY: Content and predictive validity

SUBSCALES: None

TARGET AUDIENCE: Grade 10 biology students

RECOMMENDED USE: Predicting success in biology courses; measuring change due to instruction

ADMINISTRATION: Directions given in test manual

AREA MEASURED: Understanding of science and its methods

CLASSROOM USE: To evaluate student ability to understand scientific processes, experimentation, and interpretation of data

---

The 40 multiple-choice items on this test were designed to determine the ability of students to recognize adequate criteria for accepting or rejecting hypotheses, the need for controls in experimental designs in science, as well as adequate sampling and careful measurement in the laboratory. This test can be used to predict success in biology courses.

Beginning-of-year and end-of-year norms are available in the manual from data gathered on more than 24,000 students from various parts of the country. Raw scores can be interpreted through the use of percentile rank data.

Correlation data between the Processes of Science Test, the BSCS Comprehensive Final Examination, and the Differential Aptitude Tests are presented in table form in the test manual.

Reusable test booklets are available for $3.25 per package of 25. A specimen set may be obtained for 50¢. A manual and scoring key may be purchased for 35¢.

TITLE: Tests for Patterns and Processes

AUTHOR: Biological Sciences Curriculum Study

PUBLISHER: The Psychological Corporation

DATE OF PUBLICATION: 1967

NUMBER AND DESCRIPTION OF FORMS: 1 form each of six achievement tests and a final examination

TIME FOR TESTING: 45 minutes for each test

SCORING: Hand or machine

RELIABILITY: Ranges from .69 - .82 on seven tests

VALIDITY: Content validity

SUBSCALES: None

TARGET AUDIENCE: Lower ability high school biology students

RECOMMENDED USE: Assessing student progress and areas of weakness; evaluating instructional methods

ADMINISTRATION: Directions given in test manual

AREA MEASURED: Student achievement in BSCS special materials program

CLASSROOM USE: To assess student knowledge of science processes

---

There are six achievement tests and a final examination that can be used to measure the understanding by students of the text materials of the BSCS Special Materials Program. Each of the achievement tests is constructed to measure a specific number of pages in the textbook. The final examination covers the information of the entire program. Each of the achievement tests is composed of 45 multiple-choice questions. The final examination has 50 items.

Norms have been calculated by gathering test data on the performance of students in classes utilizing the Biological Science: Patterns and Processes text. Scores on each achievement test and final examination can be interpreted by percentile ranks. Data of this type are available for grades 9, 10, 11, and 12.

Test statistics such as mean, standard deviation, standard error of measurement, and item difficulty are given in the test manual for each test.

Correlation data between the Tests for Patterns and Processes, and the Differential Aptitude Tests are presented in table form in the manual. Reusable test booklets may be purchased for $4 per package of 35.

SECONDARY CHEMISTRY TESTS

TITLE: **ACS-NSTA Cooperative Examination in High School Chemistry**

AUTHOR: Examinations Committee of the Division of Chemical Education of the American Chemical Society

PUBLISHER: Examinations Committee, American Chemical Society

DATE OF PUBLICATION: 1971

NUMBER AND DESCRIPTION OF FORMS: Form 1971, 1971S (S– "scrambled version")

TIME FOR TESTING: 80 minutes

SCORING: Hand or machine **RELIABILITY:** .95

VALIDITY: Prepared by a committee of over 40 active high school chemistry teachers – pretested for level and discrimination

SUBSCALES: None

TARGET AUDIENCE: High school chemistry students

RECOMMENDED USE: End of a year's course in high school chemistry

ADMINISTRATION: Specific directions given in booklet

AREA MEASURED: Chemistry achievement

CLASSROOM USE: To evaluate student ability in the areas of chemical processes, applications of knowledge, and recall of information

---

This test is the latest form of tests dating back to 1957. The items in the test purport to measure the recall of information, application of principles, and application of quantitative principles. There is no table which keys each question to the mental skills mentioned.

The test is divided into two parts – each with 40 questions. Each part is equally valid with the use of all 80 questions providing a better sampling of chemistry knowledge.

Raw scores corrected for guessing can be interpreted by percentile rank on six sets of norms. The six norm tables have been constructed into subgroups descriptions. The subgroups are determined according to semesters of mathematics taken by the student prior to chemistry enrollment and if physics was taken before chemistry. Characteristics of each subgroup are listed in the norm booklet. This includes the number of students in the subgroup, year in school, lecture minutes per week, laboratory minutes per week, length of class periods in minutes, type of school, professional goals, and career choice of the students.

Test booklets sell for $7 per package of 25, $3 per package of 10 and single copies are available at 50¢ each. Specimen sets are $1.

TITLE: **ACS-NSTA Cooperative Examination in High School Chemistry (Advanced Level)**

AUTHOR: Examinations Committee of the Division of Chemical Education of the American Chemical Society

PUBLISHER: Examinations Committee of the American Chemical Society

DATE OF PUBLICATION: 1972

NUMBER AND DESCRIPTION OF FORMS: Form 1972 ADV

TIME FOR TESTING: 80 minutes

SCORING: Hand or machine

RELIABILITY: .95

VALIDITY: Prepared by a committee of over 40 active high school chemistry teachers—pretested for level and discrimination

SUBSCALES: None

TARGET AUDIENCE: Advanced high school chemistry students

RECOMMENDED USE: End of year's course in advanced high school chemistry or honors course

ADMINISTRATION: Discussed in test administration pamphlet

AREA MEASURED: Chemistry achievement

CLASSROOM USE: To evaluate student ability in the areas of chemical processes, application of knowledge, and recall of information

---

This test is designed to measure chemistry achievement for high school students in advanced or honors chemistry courses. Part I of the test appears to measure recall of knowledge and application of the principles of chemistry. Part II seems to stress the solving of mathematical problems in chemistry.

Raw scores corrected for guessing can be interpreted by percentile rank on five sets of norms. The five norm tables have been constructed into subgroup descriptions. The subgroups are determined according to semesters of mathematics taken by the student prior to chemistry enrollment and if physics was taken before chemistry. Characteristics of each subgroup are listed in the norm booklet. Characteristics include the year in school, sex, lecture minutes per week, laboratory minutes per week, length of class periods in minutes, type of school, professional goals, and career choice of the students.

Test booklets sell for $7 per package of 25, $3 per package of 10, and single copies are available at 50¢ each. Specimen sets, $1.

TITLE: Anderson-Fisk Chemistry Test

AUTHOR: Kenneth Anderson and Franklin Fisk

PUBLISHER: Harcourt Brace Jovanovich, Inc.

DATE OF PUBLICATION: 1966

NUMBER AND DESCRIPTION OF FORMS: Forms E and F

TIME FOR TESTING: Maximum of 40 minutes

SCORING: Hand or machine scoring

RELIABILITY: Form E - .88; Form F - .87

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: High school chemistry students

RECOMMENDED USE: Grouping information, evaluation of instructional methods and scholastic growth, appraisal of chemistry curriculum

ADMINISTRATION: Specific directions given in test manual

AREA MEASURED: The extent of objective attainment by students of a typical high school chemistry course

CLASSROOM USE: To evaluate student knowledge of chemical reactions, the periodic table, and the comprehension of chemistry principles

---

The instrument measures primarily in the three cognitive areas of knowledge, comprehension, and application, and encompasses chemistry content areas typically found in the traditional and modern high school courses.

Complete item analysis data are reported for each item on both forms with the mean difficulty index of .50 and the median discrimination index of .464 for Form E and .454 for Form F.

The test has 55, 4-distractor items plus a "Don't Know" distractor to reduce guessing.

Raw scores or nunber correct may be converted into standard scores, percentile ranks, and stanines. These scores and their interpretation are discussed completely in the test manual. The standard error of measurement is explained in relation to the "true" score.

Percentile ranks on the Anderson-Fisk Test can be compared to percentile ranks on the Otis Test (mental ability). Through this comparison, test interpreters can infer whether chemistry achievement is consistent with ability.

The test sells for $9 per package of 35. A specimen set, for $1.50.

TITLE: **Cooperative Science Test - Chemistry**

AUTHOR: Cooperative Test Division of ETS

PUBLISHER: Educational Testing Service

DATE OF PUBLICATION: 1963

NUMBER AND DESCRIPTION OF FORMS: Forms A, B

TIME FOR TESTING: 40 minutes for each of two parts

SCORING: Hand or machine

RELIABILITY: Total test, Form A - .91; Total test, Form B - .88

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 10-12

RECOMMENDED USE: Assessing achievement, grouping students, diagnostic information

ADMINISTRATION: Specific instructions given in test manual

AREA MEASURED: Chemistry achievement

CLASSROOM USE: To evaluate the student on factual knowledge in chemistry, understanding of chemistry principles, and application of chemical knowledge

---

Both parts of this test measure in the cognitive skill areas of knowledge, comprehension, application, analysis and synthesis. Part I of the test relates to chemistry principles typically found in a chemistry course. Part II deals with laboratory skills, materials, and laboratory records and reports.

Normative data have been gathered on students in the 10th through 12th grades. Urban, suburban, and national norms have been constructed and can be found in the test manual in table form.

Raw scores are changed to converted scores for interpretation by percentile rank on the appropriate norm table. The manual clearly describes the steps necessary for interpreting an individual's score.

Item analysis data, standard deviations, and other useful statistics can be found in the manual.

Test booklets are available for $6 per package of 20. A specimen set can be obtained for $3.

TITLE: **Emporia Chemistry Test**

AUTHOR: A.T. Ericson and M.W. Sanders

PUBLISHER: Bureau of Educational Measurements, Kansas State Teachers College

DATE OF PUBLICATION: 1964

NUMBER AND DESCRIPTION OF FORMS: Forms A, B

TIME FOR TESTING: 40 minutes for each test

SCORING: Hand

RELIABILITY:

Form A	Test I	– .91	Form B	Test I	– .90
	Test II	– .88		Test II	– .90

SUBSCALES: None

VALIDITY: Claims content validity

TARGET AUDIENCE: High school chemistry students

RECOMMENDED USE: To determine student achievement; evaluate instruction; assign course grades; analyze student or class weaknesses

ADMINISTRATION: Brief directions given in test manual

AREA MEASURED: Chemistry achievement

CLASSROOM USE: To evaluate student factual knowledge in chemistry

---

Each of the four tests available contains one-hundred, 5-alternative multiple-choice questions. Both forms of Test I are designed to be given after one semester of chemistry coursework. Each form of Test II is geared for assessing student achievement on a full year of chemistry instruction. The test items relate to the definitions, formulas, equations, principles, theories, and problems of chemistry.

Test scores are interpreted by the use of percentile ranks from normative data gathered from 11,700 student scores. Norms were calculated from scores collected from 278 schools across the nation.

The manual suggests that student scores on the Emporia Chemistry Test can be used in determining course grades. The marking suggestions follow the typical bell curve method.

The test sells for $1.75 per package of 25 (directions and key included). In quantities less than 25, the tests sell for 10¢; directions, 15¢; key, 10¢. A specimen set can be obtained for 50¢ postpaid.

TITLE: General Chemistry Test

AUTHOR: Lester D. Crow and Roy S. Cook

PUBLISHER: Psychometric Affiliates

DATE OF PUBLICATION: 1962

NUMBER AND DESCRIPTION OF FORMS: Form A

TIME FOR TESTING: 40 minutes

SCORING: Hand

RELIABILITY: .94

VALIDITY: Content validity

SUBSCALES: None

TARGET AUDIENCE: Chemistry students in grades 10 through 12 and college

RECOMMENDED USE: Not discussed

ADMINISTRATION: Brief directions given

AREA MEASURED: Chemistry achievement

CLASSROOM USE: To evaluate student knowledge of chemistry facts and principles

---

This test is composed of one-hundred-twenty, 4-alternative questions divided into 3 parts. Part I treats the uses, processes, and results of chemical reactions. Part II deals with formulas and valences, while Part III tests on miscellaneous chemical facts.

Raw scores are interpreted by percentile rank from normative information gathered on nearly 6,000 students.

Test booklets may be purchased for $7.50 per package of 25 tests, and a specimen set may be obtained for $2.

TITLE: Minnesota High School Achievement Examination - Chemistry

AUTHOR: V.L. Lohmann, Editor

PUBLISHER: American Guidance Service, Inc.

DATE OF PUBLICATION: 1972 - one form of this test is revised each year

NUMBER AND DESCRIPTION OF FORMS: Forms EH, FI, GJ

TIME FOR TESTING: 60 minutes

SCORING: Hand or machine

RELIABILITY: Not discussed

VALIDITY: Claims content validity

SUBSCALES: The 16 units of the test can be used as subscales

TARGET AUDIENCE: High school chemistry students

RECOMMENDED USE: Improvement of instruction; curriculum analysis; group diagnosis; pupil progress; guidance

ADMINISTRATION: Directions given in test manual

AREA MEASURED: Chemistry achievement

CLASSROOM USE: To evaluate factual recall and knowledge of definitions and formulas in chemistry

---

This achievement test is part of a battery of 26 other tests, prepared for evaluating students in Minnesota schools. The test manual claims that the use of the test need not be limited to Minnesota students.

The test is divided into 16 units with a total of 93 items. Each of these units may be used as a subscale to determine instructional effectiveness or student weaknesses. The units are (1) The Atomic Chart, (2) Atomic Structure, (3) Organic Chemistry, (4) Gas Laws, (5) Solutions, (6) Electrolysis, (7) Nucleonics, (8) Oxidation-Reduction, (9) Analysis, (10) Metals and Metallurgy, (11) Acids, Bases, Neutralization, (12) Formulas, (13) Measurement, (14) Ionization, (15) Hydrogen, Oxygen, Water, and (16) Sulphur. The content subdivisions apply only to form FI. Other forms differ slightly in content.

Normative data and item analysis data can be found in the test manual. Raw scores can be interpreted by the use of percentile ranks.

Copies of this test sell for 10¢ each, and a test manual may be obtained for $1. A specimen set may be purchased for $1.

SECONDARY EARTH SCIENCE TESTS

TITLE: Dubins Earth Science Test

AUTHOR: M. Ira Dubins

PUBLISHER: Harcourt Brace Jovanovich, Inc.

DATE OF PUBLICATION: 1969

NUMBER AND DESCRIPTION OF FORMS: Form A and Form B

TIME FOR TESTING: 40 minutes

SCORING: Hand or machine

RELIABILITY: .88 (8th Grade); .87 (9th Grade-Form A); .89 (9th Grade-Form B)

VALIDITY: Claims content validity **SUBSCALES:** None

TARGET AUDIENCE: 8th and 9th grade earth science students

RECOMMENDED USE: Classification of students, evaluation of instruction or methods and scholastic growth, appraisal of earth science curriculum

ADMINISTRATION: Specific directions given in manual

AREA MEASURED: Attainment of objectives in typical earth science classes in grades 8 through 12

CLASSROOM USE: To evaluate knowledge level mental activities of earth science students

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The Dubins Earth Science Test has been developed to measure achievement in earth science classes that use the traditional and modern approaches. The impact of the Earth Science Curriculum Project has been taken into consideration in designing this instrument.

There are sixty, 5-alternative items that measure the skills of knowledge, understanding, and application in the content areas of Geology, Astronomy, Meteorology, and Oceanography. The fifth alternative is a "Don't Know" option which is included to prevent guessing.

Item analysis data are included in the test manual on each question for both grade levels and both forms. The mean difficulty for Form A, 8th grade is .417 and for the 9th is .485. Mean difficulty for Form B, grade 8 is .409 and for grade 9 is .490. The median discrimination indices for grade 8 are .432 for Form A and .445 for Form B. Grade 9 discrimination for Form A is .425 and for Form B is .465. Raw scores are converted to standard scores and may be interpreted through the use of percentile ranks and stanines. Conversion tables are included in the test manual. Tests sell for $9 per package of 35. A specimen set may be obtained for $1.50.

TITLE: Science Tests - Content Evaluation Series

AUTHOR: Ernestine O'Connell

PUBLISHER: Houghton Mifflin Company

DATE OF PUBLICATION: 1969

NUMBER AND DESCRIPTION OF FORMS: Form 1

TIME FOR TESTING: 40 minutes (strict)

SCORING: Hand or machine scoring

RELIABILITY: Not discussed

VALIDITY: Content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 8 and 9

RECOMMENDED USE: To assess student's earth science literacy and reasoning ability

ADMINISTRATION: Specific directions given in test manual

AREA MEASURED: Earth science achievement

CLASSROOM USE: To evaluate student knowledge of facts and application of principles and processes of earth science

---

This test purports to measure vocabulary and concept understanding of 8th and 9th grade students in the area of earth science. The test manual states that the questions have been derived from traditional and contemporary content and approaches.

The raw scores are converted to standard scores and then to percentile ranks and stanines. Each of these scores is described for the teacher, and conversion tables accompany the manual.

The earth science test covers the subject-matter areas of geology, astronomy, and meteorology. Each item is keyed to a particular area and subtopic. Questions are further classified into knowledge, understanding, and thinking skills and abilities.

Test booklets are available for $11.55 for a package of 35 which includes the physical science test. A specimen kit may be obtained for $1.41.

SECONDARY GENERAL SCIENCE TESTS

TITLE: Adkins-McBride General Science Test

AUTHOR: Leona Adkins and Richard McBride

PUBLISHER: Psychometric Affiliates

DATE OF PUBLICATION: 1969

NUMBER AND DESCRIPTION OF FORMS: 1 form

TIME FOR TESTING: May have unlimited time; can be completed in one class period

SCORING: Hand

RELIABILITY: .92

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: General science students in grades 8-12

RECOMMENDED USE: Not discussed

ADMINISTRATION: Brief directions given

AREA MEASURED: General science achievement

CLASSROOM USE: To evaluate factual knowledge of general science students

---

The one-hundred, 4-alternative multiple-choice items on this test measure general science achievement with content emphasis in chemistry, biology, physics, and geology. An item pool of questions from surveys of secondary and college textbooks and science curricula was compiled and from these the present test was constructed.

Normative data were gathered from test scores on 649 students. Norm tables are given in the test manual so that raw scores can be interpreted through the use of percentile ranks. Separate data are given for students with 1 or 2 semesters of science, 3 to 8 semesters of science, and 9 or more semesters of science.

Test booklets are available for $3.50 for a package of 25 tests. A specimen set may be obtained for $1.50.

TITLE: Cooperative Science Test - Advanced General Science

AUTHOR: Cooperative Test Division of ETS

PUBLISHER: Educational Testing Service

DATE OF PUBLICATION: 1962

NUMBER AND DESCRIPTION OF FORMS: Forms A, B

TIME FOR TESTING: 40 minutes for each part

SCORING: Hand or machine

RELIABILITY: .94 for both forms

VALIDITY: Claims content validity

TARGET AUDIENCE: Students in grades 8 and 9

RECOMMENDED USE: Assessing achievement, grouping students, gathering diagnostic information

ADMINISTRATION: Specific directions given in manual

AREA MEASURED: General science achievement

CLASSROOM USE: To evaluate student knowledge of facts, and understanding of the principles of general science

---

Each of the two parts of this test contains sixty, 5-alternative multiple-choice items. Part I covers the content areas of astronomy, geology, meteorology, and biology. Part II contains items on chemistry and physics. Each item on each of the two forms is keyed by content area and by the cognitive skills of knowledge, comprehension, application, analysis, and evaluation.

Item analysis data are given in table form. Each question has the difficulty level (percent passing) listed in table form. The mean item discrimination indices for each grade level and each form are about .43.

Normative data are given in the test manual for urban, suburban, and national students taking the test. These norms were gathered on 8th and 9th grade students from various schools across the country.

Raw scores can be interpreted by transformation to converted scores and then compared to percentile ranks. Directions for using the norm tables are clearly stated in the test manual.

Test booklets sell for $6 per package of 20. A specimen set can be obtained for $3.

TITLE: **Cooperative Science Test - General Science**

AUTHOR: Cooperative Test Division of ETS

PUBLISHER: Educational Testing Service

DATE OF PUBLICATION: 1962

NUMBER AND DESCRIPTION OF FORMS: Forms A, B

TIME FOR TESTING: 40 minutes

SCORING: Hand or machine

RELIABILITY:

Form A	Grade 7 – .89	Form B	Grade 7 – .90
	Grade 8 – .91		Grade 8 – .90
	Grade 9 – .92		Grade 9 – .92

VALIDITY: Content validity claimed

TARGET AUDIENCE: Students in grades 7-9

RECOMMENDED USE: Assessing achievement, grouping students, gathering diagnostic information

ADMINISTRATION: Specific directions given in manual

AREA MEASURED: General science achievement

CLASSROOM USE: To evaluate student ability to understand general science principles and apply them

---

The two forms of the test contain sixty, 5-alternative multiple-choice items. Each item is classified in table form according to the cognitive skill areas of knowledge, comprehension, application, analysis, and synthesis, as well as the content areas of physics, chemistry, biology, astronomy, geology, and meteorology.

Urban, suburban, and national norms are listed in the test manual with data gathered on more than 2,000 students in grades 7, 8, and 9.

Raw scores are transformed into converted scores and can be interpreted with respect to percentile ranks. Other test statistics, such as item difficulty, item discrimination, standard deviation, and mean, are listed in the manual for each form and for each grade level for which the test is designed.

Test booklets sell for $6 per package of 20. A specimen set is available for $3.

TITLE: **Educational Development Series - Senior Level Science**

AUTHOR: Scholastic Testing Service, Inc.

PUBLISHER: Scholastic Testing Service, Inc.

DATE OF PUBLICATION: 1965

NUMBER AND DESCRIPTION OF FORMS: Form A

TIME FOR TESTING: 40 minutes

SCORING: Machine scoring by STS

RELIABILITY: Ranges from .88 to .89 across grades

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 9-12

RECOMMENDED USE: For achievement comparison; for career planning

ADMINISTRATION: Specific directions given

AREA MEASURED: Science achievement

CLASSROOM USE: To evaluate student knowledge of facts and comprehension of science principles

---

There are 75 questions on this science test, a portion of a battery of tests designed for high school students. The test claims to measure science concepts, ability to think critically, and ability to draw conclusions from data. Each question is keyed in the content areas of Health and Safety, Physical Science, Biological Science, Earth and Astronomy, and Critical Thinking. The majority of the questions are labeled in the Critical Thinking category.

The technical report which can be purchased through STS gives information on test development, test means, norms, validity development, percentile ranks, grade score interpretation, reliability, and correlations with other tests. The technical report should aid the tester with test score interpretation.

The complete battery of tests including the science test, may be purchased for $22 per package of 20 tests and a test manual.

TITLE: Emporia General Science Test

AUTHOR: Donald Cross and M.W. Sanders

PUBLISHER: Bureau of Educational Measurements, Kansas State Teachers College

DATE OF PUBLICATION: 1964

NUMBER AND DESCRIPTION OF FORMS: Forms A, B

TIME FOR TESTING: 40 minutes for each test

SCORING: Hand

RELIABILITY: Form A Test I – .92 Form B Test I – .93
Test II – .91 Test II – .93

VALIDITY: Content validity claimed

SUBSCALES: None

TARGET AUDIENCE: Students in a first course of high school general science

RECOMMENDED USE: Determining achievement, assigning school marks, analyzing class and student weaknesses

ADMINISTRATION: Brief directions given in test manual

AREA MEASURED: General science achievement

CLASSROOM USE: To evaluate factual knowledge of general science

---

The content areas included in both forms of these two general science tests are those typically found in traditional general science classes. Test I includes items on liquids, pressure, light, environment, air, foods, narcotics, hygiene, clothing, diseases, housing, sanitation, heat, temperature, fire, water, and the heavenly bodies. Test II treats the content areas of heavenly bodies, air, weather and climate, food, plant life, water, water power, hygiene, health, physiology, fire and heat, rocks, soils, building materials, machines, electricity, light and lightning, sound and communication, matter and energy, transportation, heredity, and natural selection.

The test manual gives the equivalent percentile ranks for raw scores on each test and test form. Suggestions are also given in the manual for assigning school marks on the basis of percentile ranks on this general science test.

The test sells for $1.75 per package of 25 (directions and key included). In quantities less than 25, the tests sell for 10¢; directions, 15¢; key, 10¢. A specimen set can be obtained for 50¢ postpaid.

TITLE: **Fundamentals Evaluation Test - Science**

AUTHOR: David F. Votaw

PUBLISHER: Steck-Vaughn Company

DATE OF PUBLICATION: 1959

NUMBER AND DESCRIPTION OF FORMS: Forms A, B, C, D

TIME FOR TESTING: 22 minutes

SCORING: Hand or machine

RELIABILITY: Ranges from .87 to .97 by intercorrelation of forms

VALIDITY: Claims content validity and some concurrent validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 9-12

RECOMMENDED USE: Measure general achievement; locate gifted students; identify strengths and weaknesses in scholastic program and individual students

ADMINISTRATION: Directions in test manual

AREA MEASURED: Knowledge of science and ability to see simple application

CLASSROOM USE: To evaluate student basic science knowledge of definition and principles

---

This test is part of a battery of tests which include vocabulary comprehension, history and social studies, and mathematics.

The science portion of the battery contains seventy-five, 3-alternative multiple-choice questions, which measure achievement in the content areas of physics, chemistry, astronomy, meteorology, human life, animal life, plant life, heat and its control, electricity, foods, sound, light, geology, energy, nature of scientific theory, and conservation.

Number of correct responses are converted to score equivalents which can be interpreted by percentile rank through conversion tables.

Tests may be purchased for $5 for 25 tests. A specimen set may be obtained for 25¢.

TITLE: **Metropolitan Achievement Tests - Advanced Science**

AUTHOR: Walter N. Durost and others

PUBLISHER: Harcourt Brace Jovanovich, Inc.

DATE OF PUBLICATION: 1970

NUMBER AND DESCRIPTION OF FORMS: Forms F, G, H

TIME FOR TESTING: 35 minutes

SCORING: Hand or machine

RELIABILITY: .95

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 7-9

RECOMMENDED USE: Class organization; selection of instructional materials determining student strengths and weaknesses

ADMINISTRATION: Specific directions given in administration booklet

AREA MEASURED: Achievement in science

CLASSROOM USE: To evaluate factual knowledge and comprehension, and application of science principles

---

The 80 items on this science test are part of a battery of tests geared for use with junior high school students. The test is divided into two sections. The first section deals with science vocabulary, the understanding of scientific terms and the use of these terms in science. The second section treats the learning of factual material and the application of understandings and generalizations in science.

Raw scores on the test are converted to standard scores and may be interpreted by percentile rank on separate norm tables for each grade. Further interpretation can be made through stanines. The test manual describes the development of this test and lists test statistics such as reliabilities, standard error of measurement, and standard deviations.

Tests may be purchased for $5.20 per package of 35, and an Examiner's Kit may be obtained for $1.25.

TITLE: Metropolitan Achievement Tests - High School Science Test

AUTHOR: Walter N. Durost, General Editor, and others

PUBLISHER: Harcourt Brace Jovanovich, Inc.

DATE OF PUBLICATION: 1964

NUMBER AND DESCRIPTION OF FORMS: Forms Am, Bm

TIME FOR TESTING: 45 minutes

SCORING: Hand or machine

RELIABILITY: Ranges from .81 to .87

VALIDITY: Claims content validity

SUBSCALES: Concepts and Understandings; Information

TARGET AUDIENCE: Students in grades 9-12

RECOMMENDED USE: For educational and vocational student guidance; for evaluation of instructional programs and material; for administrative purposes

ADMINISTRATION: Specific directions given in test manual

AREA MEASURED: Achievement in science

CLASSROOM USE: To evaluate factual knowledge and comprehension, and application of science principles

---

The science portion of the Metropolitan Achievement Tests is composed of two tests. Test I is subdivided into two parts. The first part treats science vocabulary, the understanding of scientific terms, and their use in science. Part two deals with comprehension of scientific material. Test II measures the students' ability on learning factual information and applying understandings and generalizations.

Raw scores on the test are converted to standard scores and may be interpreted by percentile rank on separate norm tables for each grade. Further interpretation can be made through stanines. The test manual describes the development of this test and lists test statistics such as reliabilities, standard error of measurement, standard deviations, means, and item difficulty. Two-year college norms are available on request.

Test booklets may be purchased for $5.70 per package of 35. A specimen set may be obtained for $1.25.

TITLE: Read General Science Test

AUTHOR: John G. Read

PUBLISHER: Harcourt Brace Jovanovich, Inc.

DATE OF PUBLICATION: 1965

NUMBER AND DESCRIPTION OF FORMS: Form E and Form F

TIME FOR TESTING: 40 minutes

SCORING: Hand or machine

RELIABILITY: .90 (7th grade); .91 (8th grade); .91 (9th grade)

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: 7th, 8th, and 9th grade general science students

RECOMMENDED USE: Grouping of students, evaluation of instructional methods and scholastic growth, appraisal of general science curriculum

ADMINISTRATION: Specific directions given in test manual

AREA MEASURED: Attainment of important objectives in a typical general science course –

CLASSROOM USE: To evaluate student comprehension and application of science principles

---

This instrument is a revision of the 1951 version and has been updated to include new content areas in biology, earth science, physics, chemistry, astronomy and space science, and attitudes and methods. The teacher's manual claims that every attempt has been made to reflect curricular and instructional changes.

Items are keyed by content area and skill. The majority of questions are on the knowledge level with others classified in the understanding and application levels.

Item analysis data are given in the manual with the mean difficulty indices of .42 for 7th grade, .50 for 8th grade, and .54 for 9th grade. The median discrimination is .458 for Form E and .470 for Form F.

There are seventy-five, 5-alternative multiple-choice items with the fifth distractor designated as "Don't Know." The DK response is included to minimize guessing.

Raw scores can be converted into standard scores which can then be interpreted by percentile rank and stanines. There are separate normative data for 7th, 8th, and 9th grades. Tests sell for $9 per package of 35.

TITLE: **Stanford Achievement Test - Advanced Science Test**

AUTHOR: Truman L. Kelley and others

PUBLISHER: Harcourt Brace Jovanovich, Inc.

DATE OF PUBLICATION: 1964

NUMBER AND DESCRIPTION OF FORMS: Forms W, X, Y, Z

TIME FOR TESTING: 25 minutes

SCORING: Hand or machine

RELIABILITY: Grade 7 - .88; Grade 8 - .89; Grade 9 - .89

VALIDITY: Content validity claimed

TARGET AUDIENCE: Students in grades 7-9

RECOMMENDED USE: To provide data concerning pupil science achievement

ADMINISTRATION: Specific directions given in test manual

AREA MEASURED: Science achievement

CLASSROOM USE: To evaluate factual knowledge and comprehension of general science principles

---

The science test is a part of a battery of tests appropriate for students from the beginning of the 7th grade to the end of the 9th grade.

There are sixty, 4-alternative multiple-choice questions on this test. The questions seem to measure comprehension and application of science concepts with particular emphasis on the physical and biological sciences. A few of the questions utilize concepts in the earth sciences.

Raw scores can be interpreted by using conversion tables to transform the scores into grade scores, grade equivalents, percentile ranks, and stanines. The conversion tables can be found in the test manual. There are normative data given for the beginning, middle, and end of the 7th, 8th, and 9th grades.

Test booklets can be purchased for $5.20 per package of 35. A specimen set may be obtained for $1.75.

TITLE: **Stanford Achievement Test - High School Science Test**

AUTHOR: Eric F. Gardner and others

PUBLISHER: Harcourt Brace Jovanovich, Inc.

DATE OF PUBLICATION: 1965

NUMBER AND DESCRIPTION OF FORMS: Forms W, X, S

TIME FOR TESTING: 60 minutes

SCORING: Hand or machine

RELIABILITY: .89 for total science test, all grades

VALIDITY: Claims content validity

TARGET AUDIENCE: Science students grades 9-12

RECOMMENDED USE: Aid student in vocational choice; measure achievement and growth from year to year; utilize for guidance purposes

ADMINISTRATION: Specific directions given in test manual

AREA MEASURED: Science achievement and growth

CLASSROOM USE: To evaluate knowledge of scientific facts, application of scientific knowledge and analysis of science problems

---

This high school science test contains eighty-six, 4-alternative questions measuring in the content areas of physics, chemistry, earth and space science, life science, and the scientific method. The test is divided into two parts. Part A may be given without Part B and is designed for all high school students. Part B must be given in conjunction with Part A and is designed for high school students taking advanced courses. The test deals with science knowledge, generalizations, and application.

Item difficulty values are given for each question. The indices range from .09 to .92 for all grades on all forms.

The test manual contains conversion tables for standard scores, percentile ranks, stanines for each grade and for college preparatory students.

Test booklets may be purchased for $8.75 per package of 35, and a specimen set may be obtained for $2. The test manual sells for $1.40.

TITLE: Test of Science Knowledge

AUTHOR: Earth Science Curriculum Project and The Psychological Corporation

PUBLISHER: The Psychological Corporation

DATE OF PUBLICATION: 1967

NUMBER AND DESCRIPTION OF FORMS: Form S

TIME FOR TESTING: 90 minutes

SCORING: Hand or machine

RELIABILITY: Part I - .85; Part II - .83; Total - .91

VALIDITY: Content and predictive validity

SUBSCALES: Part I - Factual Knowledge; Part II - Principles

TARGET AUDIENCE: Students in grades 8-12

RECOMMENDED USE: Predicting success in science courses; measuring change due to instruction

ADMINISTRATION: Directions given in test manual

AREA MEASURED: Breadth of background in areas of general science

CLASSROOM USE: To assess student background knowledge of general science facts and principles

---

This test was specifically designed for use with students in classrooms utilizing the Earth Science Curriculum Project. Part I of the test measures the factual knowledge of students, while Part II measures their knowledge of principles and understanding of the methods of science.

Part I of the test contains 60 multiple-choice items in the physical and natural sciences. Part II is composed of 50 multiple-choice items dealing with hypothesis formation, generalizations from observations, experimental methods, measurement, and methods of collecting data.

Beginning-of-year norms for Part I were gathered on more than 8,000 students enrolled in ESCP classes in 1965. End-of-year norms are provided only for Part II of the test. These may be found in the test manual.

Correlation data between the TOSK and the ESCP Achievement Test and Comprehensive Final test are available in table form in the test manual. Coefficients of correlation can also be found between TOSK and the Differential Aptitude Tests.

Test booklets sell for $7.75 for 25 each of Part I and Part II. A specimen set may be obtained for 75¢.

SECONDARY PHYSICS TESTS

TITLE: **Cooperative Science Test - Physics**

AUTHOR: Cooperative Test Division of ETS

PUBLISHER: Eductional Testing Service

DATE OF PUBLICATION: 1963

NUMBER AND DESCRIPTION OF FORMS: Forms A, B

TIME FOR TESTING: 40 minutes for each of two parts

SCORING: Hand or machine

RELIABILITY: Total test, Form A - .90; Total test, Form B - .91

VALIDITY: Claims content validity **SUBSCALES:** None

TARGET AUDIENCE: Students in grades 10-12

RECOMMENDED USE: Assessing achievement, grouping students, gathering diagnostic information

ADMINISTRATION: Specific directions given in test manual

AREA MEASURED: Physics achievement

CLASSROOM USE: To evaluate students on factual recall, understanding of physics principles, and application of physics knowledge

---

This instrument measures physics achievement using one-hundred-fifteen, 5-alternative questions. Part I of the test deals with general concepts and principles of physics and Part II relates to laboratory activities found in typical physics classes. Each question is keyed by content area and cognitive skill. This can be found in table form in the test manual.

Norms are listed in the test manual for urban, suburban, and national test score interpretation. The normative data include information for both forms of the test gathered from information on scores of students in grades 10 through 12.

Item analysis data can be found in the manual. Mean item discrimination ranges from .36 to .42 when calculated by form and test part. Item difficulty information and standard deviations are also listed.

Raw scores are transformed to converted scores, and interpretation is possible through percentile ranks.

Test booklets sell for $6 per package of 20. A specimen set is available for $3.

TITLE: **Dunning - Abeles Physics Test**

AUTHOR: Gordon M. Dunning and Sigmund Abeles

PUBLISHER: Harcourt Brace Jovanovich, Inc.

DATE OF PUBLICATION: 1967

NUMBER AND DESCRIPTION OF FORMS: Form E and Form F

TIME FOR TESTING: 40 minutes

SCORING: Hand or machine

RELIABILITY: Form E - .87, Form F - .86

VALIDITY: Content validity is claimed

SUBSCALES: None

TARGET AUDIENCE: High school physics students

RECOMMENDED USE: Classification of students; evaluation of instructional methods and scholastic growth; appraisal of the physics curriculum

ADMINISTRATION: Specific directions given in manual

AREA MEASURED: Achievement in high school physics

CLASSROOM USE: To evaluate students, factual recall and application of physics knowledge

---

This physics test measures in the mental skill areas of knowledge, understanding, and application in the content areas of Mechanics, Electricity and Magnetism, Atomic and Nuclear Physics, Wave Motion and Light, and Kinetic-Molecular Theory. The areas tested are adapted to traditional and modern instructional approaches.

The test contains fifty, 5-alternative multiple-choice questions with a "Don't Know" alternative to reduce the amount of guessing.

Item analysis data are included in the test manual for each question. The mean difficulty for both forms of the test is .50. The median discrimination index for Form E is .45 and for Form F is .46.

Raw scores may be converted to standard scores and can be interpreted with respect to percentile rank and stanines. Conversion tables can be found in the test manual.

Test booklets sell for $9 per package of 35. A specimen set may be obtained for $1.50.

TITLE: Emporia Physics Test

AUTHOR: Gerald Witten and M. W. Sanders

PUBLISHER: Bureau of Educational Measurements
Kansas State Teachers College

DATE OF PUBLICATION: 1964

NUMBER AND DESCRIPTION OF FORMS: Forms A, B

TIME FOR TESTING: 40 minutes for each test

SCORING: Hand

RELIABILITY: Form A Test I - .92 Form B Test I - .90
Test II - .91 Test II - .90

VALIDITY: Content validity

SUBSCALES: None

TARGET AUDIENCE: High school physics students

RECOMMENDED USE: To determine status of individual students or classes on physics achievement on national norms

ADMINISTRATION: Brief directions given in test manual

AREA MEASURED: Physics achievement

CLASSROOM USE: To evaluate factual knowledge in physics

Each form of this testing instrument is composed of two parts, each covering about one semester's course work in high school physics. Test I deals with the content area of mechanics and the typical topics of a first semester course. Test II treats the topics of heat, magnetism, electricity, and sound.

Each test has from ninety to one-hundred, 4-alternative multiple choice questions dealing mostly with the recall of physics vocabulary and factual information.

Raw scores are interpreted through percentile ranks on norm tables gathered on 8,110 students in many schools across the country. The manual suggests that classroom median scores can also be interpreted by the percentile norm table.

The test sells for $1.75 per package of 25 (directions and key included). In quantities less than 25, the tests sell for 10¢; directions, 15¢; key, 10¢. A specimen set can be obtained for 50¢ postpaid.

TITLE: General Physics Test

AUTHOR: Lester D. Crow and Roy S. Cook

PUBLISHER: Psychometric Affiliates

DATE OF PUBLICATION: 1970

NUMBER AND DESCRIPTION OF FORMS: Form A

TIME FOR TESTING: 40 minutes

SCORING: Hand

RELIABIITY: .90

VALIDITY: Content validity

SUBSCALES: None

TARGET AUDIENCE: High school and college physics students

RECOMMENDED USE: Not discussed

ADMINISTRATION: Briet directions given in manual

AREA MEASURED: Physics achievement

CLASSROOM USE: To evaluate student knowledge of physics facts and principles

---

This physics test is composed of one-hundred-thirty, 4-alternative multiple choice items divided into two test parts. Part I contains 60 questions dealing with the uses and application of physics principles, while Part II treats miscellaneous factual information and famous scientists.

Raw scores can be compared to percentile ranks on normative data calculated from test scores of more than 6,000 students.

Test booklets sell for $3.50 for a package of 25 tests. Specimen sets may be obtained for $2 each.

TITLE: **Minnesota High School Achievement Examination - Physics**

AUTHOR: V. L. Lohmann, Editor

PUBLISHER: American Guidance Service, Inc.

DATE OF PUBLICATION: 1972 – one form of this test is revised each year

NUMBER AND DESCRIPTION OF FORMS: Forms EH, FI, GJ

TIME FOR TESTING: 60 minutes

SCORING: Hand or machine

RELIABILITY: Not discussed

VALIDITY: Content validity claimed

SUBSCALES: 6 content subscales may be used

TARGET AUDIENCE: High school physics students

RECOMMENDED USE: Improvement of instruction; curriculum analysis; group diagnosis; pupil progress; guidance

ADMINISTRATION: Directions given in test manual

AREA MEASURED: Physics achievement

CLASSROOM USE: To determine student knowledge of factual recall, definitions of terms, and comprehension of principles in physics

---

This achievement is a part of a test battery covering 26 subject areas in the junior and senior high schools of Minnesota. The test manual claims that the use of the test need not be limited to Minnesota students.

The test is divided into 6 units. Each of these units may be used as a subscale to evaluate instructional effectiveness or student weaknesses. The units are (1) Measurement, (2) Mechanics, (3) Structure of Matter, (4) Heat, (5) Sound, Light and Wave Motion, and (6) Electricity and Magnetism. There are eighty, 5-alternative multiple-choice questions on the test. The student raw score can be interpreted by percentile rank. The content subdivisions apply only to form FI. Other forms will differ slightly in content areas.

Normative data and item analysis data can be found in table form in the test manual.

Copies of this test sell for 10¢ each and a test manual may be obtained for $1. A specimen set may be obtained for $1.10.

OTHER SECONDARY SCIENCE TESTS

TITLE: **Iowa Tests of Educational Development - Science**

AUTHOR: E. F. Lindquist and Leonard S. Feldt

PUBLISHER: Science Research Associates, Inc.

DATE OF PUBLICATION: 1970

NUMBER AND DESCRIPTION OF FORMS: Forms X5, Y5

TIME FOR TESTING: 20 minutes

SCORING: Hand or machine

RELIABILITY: Not discussed

VALIDITY: Content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 9-12

RECOMMENDED USE: Evaluation of program and evaluation of pupil progress

ADMINISTRATION: Specific directions given in manual

AREA MEASURED: Achievement and progress in science

CLASSROOM USE: To evaluate knowledge of scientific facts and application of science principles

---

The Iowa Test of Educational Development is a battery of tests in the areas of reading comprehension, language arts, mathematics, social studies background, science background, and use of sources. Achievement in science is determined through 30 background questions plus 18 science questions in the reading comprehension portion of the test. The science background questions cover the content areas of biology, physics, chemistry, geology, astronomy and space, and the scientific method. These background items assess student skills in understanding facts, principles, applications, and generalizations.

Raw scores can be converted into standard scores and interpreted by percentile rank or stanines. The test handbook which accompanies the tests explains score interpretation and suggests a variety of ways in which the test can be used. The handbook suggests score usage with respect to discovering group needs, discovering individual needs, measuring growth, and aiding in educational guidance.

Tests sell for $20.40 for a package of 25 tests.

TITLE: Minnesota High School Achievement Examination - Science Grade 9

AUTHOR: V. L. Lohmann, Editor

PUBLISHER: American Guidance Service, Inc.

DATE OF PUBLICATION: 1972 - one form of this test is revised each year

NUMBER AND DESCRIPTION OF FORMS: Forms EH, FI, GJ

TIME FOR TESTING: 60 minutes

SCORING: Hand or machine

RELIABILITY: Not discussed

VALIDITY: Content validity claimed

SUBSCALES: 10 content subscales may be used

TARGET AUDIENCE: Grade 9 physical science students

RECOMMENDED USE: Improvement of instruction; curriculum analysis; group diagnosis; pupil progress; guidance

ADMINISTRATION: Directions given in test manual

AREA MEASURED: Physical science achievement

CLASSROOM USE: To determine factual knowledge and comprehension of principles in physical science

---

This is one of 26 tests used to evaluate student achievement in content areas in Minnesota schools. The manual claims that the use of this test need not be limited to Minnesota students.

The test is divided into 10 units. Each of these units may be used as a subscale to evaluate instructional effectiveness or student weaknesses. These units are (1) Scientific Method, (2) Basic Concepts of Matter, (3) Heat, (4) Pressure, (5) Nuclear Science, (6) Wave Motion, (7) Electricity, (8) Machines and Work, (9) Chemistry, and (10) Space Science. This test subdivision by content areas applies only to form FI. Other forms will differ slightly.

Raw scores can be interpreted by percentile rank from normative data found in table form in the test manual. Item analysis data are also given for the ninety, 5-alternative multiple-choice items.

Copies of the test sell for 10¢ per copy. A specimen set may be obtained for $1.10.

TITLE: **Science Tests - Content Evaluation Series - Physical Science**

AUTHOR: Ernestine O'Connell

PUBLISHER: Houghton Mifflin Company

DATE OF PUBLICATION: 1969

NUMBER AND DESCRIPTION OF FORMS: Form 1

TIME FOR TESTING: 40 minutes (strict)

SCORING: Hand or machine

RELIABILITY: Not discussed

VALIDITY: Content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 8 and 9

RECOMMENDED USE: To assess student's physical science literacy and reasoning ability

ADMINISTRATION: Specific directions given in test manual

AREA MEASURED: Physical science achievement

CLASSROOM USE: To evaluate student knowledge of facts and application of principles and processes of physical science

---

This test is designed to measure the student's understanding of vocabulary and concepts in physical science. The test has been formulated with the understanding that a science course at the 9th grade level may be a terminal course for some students. Therefore, the test aims at determining the level of "sophistication in science necessary for intelligent living in today's world."

Raw scores are converted to standard scores and then to percentile ranks and stanines. Separate conversion tables are listed for students in the 8th and 9th grades.

The subject matter areas covered by this test are chemistry and physics. Each question is keyed to the specific content area. The items are further keyed by skill and ability in the classifications of knowledge, understanding, and thinking.

Test booklets may be purchased for $11.55 per package of 35. The test booklets include both the physical science test and the earth science test. A specimen set may be purchased for $1.41.

TITLE: **Sequential Tests of Educational Progress - Series II - Form 2**

AUTHOR: Cooperative Tests and Services

PUBLISHER: Educational Testing Service

DATE OF PUBLICATION: 1969

NUMBER AND DESCRIPTION OF FORMS: Forms 2A, 2B

TIME FOR TESTING: 60 minutes

SCORING: Hand or machine

RELIABILITY: Ranges from .86 to .91

VALIDITY: Claims content validity

SUBSCALES: None

TARGET AUDIENCE: Students in grades 10-12

RECOMMENDED USE: To assess student progress in science

ADMINISTRATION: Specific directions given in test manual

AREA MEASURED: Understanding of science

CLASSROOM USE: To evaluate student knowledge of science facts, comprehension of scientific principles, and interpretation of data

---

This test is subdivided into two parts. Part I treats the measurement of facts, principles, and concepts in the field of science. Part II deals with the use of the knowledge a student possesses. A table of specifications which may be found in the test manual keys each item on the test to content area and mental skill. It appears that while covering the mental skills of knowledge and comprehension to some extent, a good portion of the items measure in the skill area of application. A few of the questions are in the category of higher abilities. The content area most often stressed is biology, followed by physics, chemistry, and earth science.

The test manual carries very complete statistical information for use by the teacher in student score interpretation. Among the data available are score means, standard deviations, converted scores, percentile ranks, reliabilities, and item difficulty information. Many of these are described for facilitating proper use of the test.

Test booklets are available for $7 per package of 20. A specimen set may be obtained for $5.

TITLE: Tests of Academic Progress

AUTHOR: Dale P. Scannell and others

PUBLISHER: Houghton Mifflin Company

DATE OF PUBLICATION: 1971

NUMBER AND DESCRIPTION OF FORMS: Form S

TIME FOR TESTING: 45 minutes for each grade level

SCORING: Hand or machine scoring

RELIABILITY: Not discussed

VALIDITY: Not discussed **SUBSCALES:** None

TARGET AUDIENCE: Students in grades 9-12

RECOMMENDED USE: To determine growth and mastery in biology, chemistry, earth science, and physics

ADMINISTRATION: Specific directions given in manual

CONTENT AREA: Biology, chemistry, earth science, physics

CLASSROOM USE: To evaluate factual knowledge, application of science principles and increase of achievement over time

---

This test is part of a battery of tests in social studies, composition, science, reading, mathematics, and literature.

Although specific test items are geared for a particular grade level, a great deal of overlap is built into the test. This allows for interpreting the student's score over several years to determine his progress. All four content areas typically found in the high school curriculum are represented on this test. Earth science and biology are emphasized in 9th and 10th grade tests; physics and chemistry, in the 11th and 12th grade questions.

According to the test manual, "Although the goals of basic traditional programs are carefully treated, strong recognition is given to the more recently developed and revised curricula such as the Biological Sciences Curriculum Study, the Chemical Bond Approach, Chemical Education Materials Study, Earth Science Curriculum Project, the Physical Science Study Committee, and the Project Physics from Harvard University."

Raw scores on the test are converted to standard scores and interpreted on a continuous scale for grades 9 through 12. Standard scores can be compared directly across subjects and across grades. Scores can be plotted for each student and relative progress can be determined from year to year. Percentile rank interpretation is also treated in the manual. Standard scores are converted into within grade percentile ranks. Beginning, middle, and end-of-year conversion tables are included.

Complete test booklets for this battery of tests sells for $1.29 per single copy. An examination kit is available for $3.69.

TITLE: **Test on Understanding Science (TOUS)**

AUTHOR: William Cooley and Leo Klopfer

PUBLISHER: Educational Testing Service

DATE OF PUBLICATION: 1961

NUMBER AND DESCRIPTION OF FORMS: Form W

TIME FOR TESTING: 40 minutes

SCORING: Hand or machine

RELIABILITY: Area I - .58, Area II - .52, Area III - .58, Total - .76

VALIDITY: Briefly discussed in manual

SUBSCALES: Described below

TARGET AUDIENCE: Students in grades 9-12

RECOMMENDED USE: Research purposes only

ADMINISTRATION: Specific directions given in test manual

AREA MEASURED: Understanding of the scientific enterprise, the characteristics of scientists, and the methods and aims of science

CLASSROOM USE: To determine student understanding of science and scientists

---

This instrument has been organized around three major areas of emphasis. These are (1) understandings about the scientific enterprise, (2) understandings about scientists, and (3) understandings about the methods and aims of science. Each area is defined by several themes which form the specifications of the TOUS.

The test manual indicates that the 60 questions on the TOUS may be used for research and development in science education. This may include evaluation of science programs or curricula, evaluations of summer science programs for high school students or teachers, monitoring inservice programs, and other research. The TOUS is not for ability or achievement testing.

Norms were developed on Form X of this test, and percentile rank tables are listed for grades 9 through 12. The present form of the test is a minor revision of Form X. The development of the final form of the test is described in the manual. Item analysis data, validity information, and other statistical analyses are also included.

Reusable testbooks are available for 20¢ each, and a manual is available for $1 per copy. A specimen set may be purchased for $1.25.

APPENDIX A
ADDRESSES OF PUBLISHERS

American Chemical Society
1155 16 Street, NW
Washington, DC 20036

American Guidance Service, Inc.
Publishers Building
Circle Pines, Minnesota 55014

Bureau of Educational
Measurements
Kansas State Teachers College
Emporia, Kansas 66801

Bureau of Education Research
and Service
Division of Extension and
University Services
University of Iowa
Iowa City, Iowa 52240

Educational Testing Service
Box 999
Princeton, New Jersey 08540

Examination Committee -
American Chemical Society
University of South Florida
Tampa, Florida 33620

Harcourt Brace Jovanovich, Inc.
757 Third Avenue
New York, New York 10017

Houghton Mifflin Company
110 Tremont Street
Boston, Massachusetts 02107

McGraw-Hill Book Company
330 W. 42 Street
New York, New York 10036

The Psychological Corporation
304 East 45 Street
New York, New York 10017

Psychometric Affiliates
Box 3167
Munster, Indiana 46321

Scholastic Testing Service, Inc.
480 Meyer Road
Bensenville, Illinois 60106

Science Research Associates, Inc.
259 East Erie Street
Chicago, Illinois 60611

Steck-Vaughn Company
P.O. Box 2028
Vaughn Building
Austin, Texas 78767

APPENDIX B
GLOSSARY OF TERMS

Alternative – a distractor or foil in a multiple-choice test

Item Analysis – determining the difficulty of items, discrimination power of items, and, if a multiple-choice test is used, the effectiveness of distractors

Item Difficulty – the percentage of students responding correctly on a particular test item

Mean – the average of all test scores

Median – the point at which 50 percent of the students score below and 50 percent of the students score above

Norms – a representative or standard pattern for a group

Percentile Rank – the number which represents the percent of scores below a certain point

Raw Score – the number correct on a test for an individual student

Reliability – consistency of measurement

Standard Deviation – a statistical device to indicate the amount of variability in the test scores; the square root of the average of the squared deviations above the mean

Standardized Test – a test composed of a systematic sampling of behavior, having data on reliability and validity, administered and scored according to specific instructions, and capable of being interpreted in terms of adequate norms.[1]

Standard Scores – converted raw scores; raw scores expressed in terms of the mean and standard deviation units

Stanines – normalized standard scores expressed on a nine-point scale with each of the nine bands representing the range of one-half a standard deviation unit

Validity – the degree to which a test measures what it purports to measure

[1] *Standard Terminology for Curriculum and Instruction in Local and State School Systems.* National Center for Educational Statistics. U.S. Department of Health, Education, and Welfare, Washington, D.C. 1970.

APPENDIX C
ANNOTATED BIBLIOGRAPHY ON STANDARDIZED TESTING

Educational Testing Service. *Constructing and Using Local Norms.* Educational Testing Service, Princeton, New Jersey.

The booklet gives the teacher procedures for constructing local norms for interpreting student test scores.

Educational Testing Service. *Multiple-Choice Questions: A Close Look.* Educational Testing Service, Princeton, New Jersey. 1963. 43 pages.

The pamphlet examines the use of multiple-choice questions for assessing learning outcomes. Emphasis is given to the construction of questions eliciting higher levels of cognitive activity.

Educational Testing Service. *Selected References in Educational Measurement.* Educational Testing Service, Princeton, New Jersey. 1970. 43 pages.

This pamphlet lists reference volumes, books, commentaries, and journals of interest to those in the field of testing. Some of these may be of interest to the classroom science teacher.

Educational Testing Service. *Selecting an Achievement Test: Principles and Procedures.* Educational Testing Service, Princeton, New Jersey. 1969. 34 pages.

This booklet describes some of the important characteristics of achievement tests. These characteristics are of great importance in selecting and evaluating tests for classroom use.

Englehart, Max D. *Improving Classroom Testing.* Association of Classroom Teachers of the National Education Association, Washington, D.C. 1964. 33 pages.

This handbook on testing is specifically designed as an aid to classroom teachers in constructing quality tests. Types of test questions, instructional objectives, using test data to improve instruction, and grading are but a few of the topics of interest.

Hedges, William D. *Testing and Evaluation for the Sciences in the Secondary School.* Wadsworth Publishing Company, Inc., Belmont, California. 1966. 248 pages.

This book contains information on test construction, types of tests, interpreting test results, item analysis procedures, and science tests in print. It is a handy reference for science teachers who wish to improve classroom testing.

Payne, David A. *The Specification and Measurement of Learning Outcomes.* Blaisdell Publishing Company, Waltham, Massachusetts. 1968. 209 pages.

This is one of the finest paperback references in testing for the classroom teacher. Suggestions for improving classroom testing, describing test performance, constructing tests, item analysis, and using standardized tests are given a great deal of coverage. Topic discussions are geared to classroom teachers and short-cut statistical methods are listed so that the classroom teacher can construct high quality tests.

Rothney, John W.M. *Evaluating and Reporting Pupil Progress.* Association of Classroom Teachers of the National Education Association, Washington, D.C. 1972. 33 pages.

This pamphlet lists several ideas on student evaluation and grading, types of tests, assessing student achievement, and assessing student personal-social development. The section on grading may be of particular interest to the classroom teachers.

NEWSLETTERS OF INTEREST

National Assessment of Educational Progress, published by the National Assessment of Educational Progress, staff office at 1860 Lincoln Street, Suite 300, Denver, Colorado 80203.

Test Service Notebook published by Harcourt Brace Jovanovich, Inc., 757 Third Avenue, New York, N.Y. 10017

APPENDIX D
STANDARDIZED TESTS IN PROGRESS

NAME: Comprehensive Tests of Basic Skills
Functional Range Study
Science – Level C

PUBLISHER: CTB/McGraw-Hill

This test has been tailored to the inquiry and problem-solving approaches utilized in elementary science classrooms. The test items cover a wide spectrum of science content and processes. Questions are read aloud to students and appropriate answers are selected from four pictured responses. The test is geared for use in grade two and will undergo standardization in 1973.

NAME: Comprehensive Tests of Basic Skills
Functional Range Study
Science – Level 1 – Grade 3

PUBLISHER: CTB/McGraw-Hill

This testing instrument was developed for use in the third grade to test students' command of the processes of science. The processes include knowing, classifying and comparing, measuring, summarizing data, recognizing valid hypotheses, and evaluating an experimental design. The content areas cover the biological, physical, and earth sciences. Standardization is scheduled for 1973.

NAME: Comprehensive Tests of Basic Skills
Time and Functional Range Study
Science – Level 1 – Grade 4

PUBLISHER: CTB/McGraw-Hill

Scheduled for standardization in 1973, this test is designed to measure the student's use of problem-solving skills across the content areas of the biological, physical, and earth sciences. Test directions accompany the test booklet. Answers are recorded on separate answer sheets.

NAME: Comprehensive Tests of Basic Skills
Time and Functional Range Study
Science – Levels 2, 3, 4

PUBLISHER: CTB/McGraw-Hill

Covering the content areas of the physical, biological, and earth sciences, these tests measure the student's ability to utilize his problem-solving skills. These three tests, grade levels unspecified, are scheduled for standardization in April 1973 and subsequent publication in September of the same year.

PUBLISHER'S ADDRESS: CTB/McGraw-Hill
Del Monte Research Park
Monterey, California 93904

NAME: Test on Understanding Science (TOUS)
Form Ev

PUBLISHER: Published by the authors, Leo E. Klopfer, P.B. Shoresman, E.O. Carrier, and F. Geis, Jr.

This form of the TOUS is geared for students in grades 5 through 7. The subscales on the original TOUS are not used for this test. Further information may be obtained from the authors at the address below.

NAME: Test on Understanding Science (TOUS)
Form Jw

PUBLISHER: Published by the authors, Leo E. Klopfer and E.O. Carrier

Form Jw, published in 1970, is geared for students in grades 7 through 9. The subscales of the original TOUS are not used for this test. Additional information may be obtained from the authors.

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